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ABSTRACT

This report of a research project examines the relationship between learning gain and certain noninstructional factors. Specifically, the comprehension, vocabulary, and mathematics gains of Title I students enrolled in a particular elementary school during the 1978-79 school year were correlated with 19 noninstructional variables collected from parents, students, and school records. The overall purpose of the study was to explore how each of the variables were associated with learning gain. A secondary purpose was to find a limited number of variables which would account for a substantial proportion of the learning gain so that intervention could focus on the few variables that appeared to have the greatest probability of producing increased learning gain. The research procedures included a statement of the problem, a description of the instrumentation, a discussion of the population and sampling techniques, data collection procedures, and limitations and findings of the research. (JN)

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Evaluation of Non-Instructional Factors Associated with Learning in Title I Students

PREPS RESEARCH PROJECT

1978 - 79

The Bowling Green Independent School System
Bowling Green, Kentucky

REPORT PREPARED BY:

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U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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FORWARD

This document is the final report of a PREPS research project conducted jointly by the PREPS research team of the Professional Development Center Network housed at Western Kentucky University and Mrs. Betty Farris, Title I Coordinator of the Bowling Green School System, Bowling Green, Kentucky.

The PREPS Research Team

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TITLE

Evaluation of Non-Instructional Factors Associated with Learning in Title I Students

INTRODUCTION

A great deal of time, energy, and money goes into helping remedial students make learning gains each year. This is particularly true for students in Title I programs. However, there may be factors other than those associated with Title I instruction that make a difference in how well or poorly children do as a result of Title I programs. For example, if a child stays up late every evening and comes to school very tired (s)he may profit less from instruction than a more rested child. Or, more positively, if a child receives emotional support concerning school activities from parents (s)he may profit more from Title I instruction.

The Bowling Green school system conducted this research project to examine the relationship between learning gain and certain non-instructional factors. Specifically, the comprehension, vocabulary and mathematics gains of Title I students enrolled in Parker-Bennett elementary school during the 1978-79 school year were correlated with 19 non-instructional variables collected from parents, students, and school records. These 19 variables are listed in the instrumentation section of this report. The overall purpose of the study was to explore how each of the 19 variables were associated with learning gain. A secondary purpose was to find a limited number of variables that accounted for a substantial proportion of the learning gain such that intervention could focus on the few variables that appeared to have the greatest probability of producing increased learning gain.

STATEMENT OF THE PROBLEM

How are the 19 non-instructional variables of the study correlated with each of the three dependent variables (comprehension gain, vocabulary gain, and mathematics gain*) for Title I elementary students at Parker-Bennett school? (Separate correlations were calculated for grades one through three and four through seven. *Mathematics correlations were not calculated for grades one through three due to the low number of students on whom data was available.)

What are the fewest independent variables that taken together account for a substantial correlation with comprehension and vocabulary gains? (Separate analyses were calculated for grades one through three and four through seven.)

INSTRUMENTATION

Data from Parents

A parent survey was jointly constructed by the PREPS research team and Mrs. Betty Farris, Title I Coordinator for the Bowling Green schools. The parent survey probed:

- the number of children in the household
- the number of parents in the household
- parental strictness
- parental expectation for child's schooling
- parents involvement in signing a reading contract
- parents involvement in volunteering to help the school
- number of parent-teacher conferences
- amount of television child watched
- hour child went to bed

A copy of the survey instrument can be found in the appendix.

Data Collected from Students

Title I students were administered a 16 item questionnaire that contained measures on:

- anxiety - a self concept measure
- popularity - a self concept measure
- happiness and satisfaction - a self concept measure
- perceptions of their parent's expectations of them (e.g., "parents expect too much")

The three self concept scales were part of the Piers-Harris Children's Self Concept Scale [1]. The total Piers-Harris instrument has been found to have an internal consistency between 0.78 and 0.93 using the Kuder-Richardson formula 21 and between 0.90 and 0.87 using the Spearman-Brown odd-even formula. Test-retest reliability over a four month period had been found to be 0.77. The validity of the instrument had been established by its comparison with the Lipsitt Children Self-Concept Scale (0.68) and the SRA Junior Inventory (0.64).

Student's perceptions of their parents' expectations of them was measured with a single question:

"My parents expect too much of me"

to which they replied either yes or no.

A copy of the student questionnaire can be found in the appendix.

Data Reported from School Records

School record data consisted of

- sex of the child
- free lunch eligibility
- academic aptitude
- days absent
- number of times student was retained
- number of times student transferred schools

Academic aptitude was measured with the Otis-Lennon test distributed by Psychological Corporation.

In addition to the above variables which formed the group of 19 non-instructional variables of the study, data was also collected on three dependent variables that measured learning gain in: (1) comprehension, (2) vocabulary, and (3) mathematics. Learning gain was defined as the difference between the end of the year posttest and the beginning of the year pretest.

Comprehension and vocabulary skills were measured with the Gates-MacGinitie reading test (levels A through E), a standardized test distributed by Houghton Mifflin Company.

Mathematics skills were measured with the Standford Achievement Test (levels I through III), a standardized test distributed by Harcourt Brace Jovanovich, Inc.

POPULATION AND SAMPLING

The population of the study was defined as all Title I students enrolled in the Title I program at Parker-Bennett Elementary School in Bowling Green, Kentucky during the 1978-79 school year. The sample used for data analysis consisted of those Title I students on whom complete and appropriate test scores were available.

DATA COLLECTION PROCEDURES

Parent data was collected with a parent survey which students delivered to their parents.

Student data was collected in the Title I classrooms. In grades one through three teachers read the questions aloud allowing students time to answer each question. In grades four through seven students read their own instrument.

School record data, other than standardized test data, was gathered by the Title I coordinator from permanent school records.

Standardized test data had been collected as part of the required evaluation of Title I programs. Tests were administered at the beginning of the school year as a basis for planning remedial work and again at the end of the year as a measure of student progress. Students were administered tests at their functional level (e.g., a fifth grade student functioning at the third grade level was given a third grade level test). The purpose of using functional level testing was to increase the accuracy of measurement.

ASSUMPTIONS AND LIMITATIONS

This study must be considered exploratory due to the sampling limitations. The incomplete data set was due to a partial return of parent surveys and to problems associated with functional level testing. To the extent that the sample adequately represents the population this study can be generalized to all Parker-Bennett Title I students.

Also, the low number of cases used in the second analysis necessitates that the analysis be considered exploratory. This study was designed to reduce a large set of potential variables to a smaller set. It is suggested that variables found to be more highly correlated with learning gain in this project be studied in greater depth on a larger population and at each grade level.

FINDINGS

Correlations of 19 Independent Variables
with Learning Gain--Grades one through three

Tables 1 and 2 present the correlations of the 19 non-instructional variables with comprehension and vocabulary gain for Title I students in grades one through three. (No correlations were computed for mathematics due to the low number of cases available.)

Independent variables that explained at least five percent of the variance of the dependent variable were:

Comprehension Gain

- Academic Aptitude - greater learning gain was associated with higher academic aptitude
- Bedtime - greater learning gain was associated with earlier bedtime
- Days Absent - greater learning gain was associated with more time in school
- Number of Siblings - greater learning gain was associated with fewer siblings
- Number of Parents - greater learning gain was associated with one parent
- Number of Transfers - greater learning gain was associated with fewer transfers

Table 1.

Zero-Order Correlations of Non-Instructional Variables
Collected from Parent Survey with
(1) Comprehension Gain and (2) Vocabulary Gain
for Title I Students in Grades One Through Three

Learning Gain Scores	Non-Instructional Factors Collected From Parent Survey								
	Number of Siblings n=36	Number of Parents n=36	Parental Strictness n=31	Parental Expectation for Child's Schooling n=34	Reading Contract n=34	Parent Served As School Volunteer n=34	Number of Parent-Teacher Conferences n=34	Time Child Watches TV n=36	Child's Bedtime n=36
(1) Comprehension Gain	(-0.26) P=0.13	(-0.24) P=0.16	0.05 P=0.80	0.18 P=0.31	0.19 P=0.26	(-0.09) P=0.63	(-0.19) P=0.28	(-0.08) P=0.64	(-0.34) P=0.04
(2) Vocabulary Gain	(-0.19) P=.26	(-0.08) P=0.65	0.19 P=.30	0.13 P=.46	0.03 (P=0.87)	(-0.14) P=.43	(-0.11) P=0.52	0.01 P=0.97	(-0.09) P=0.59

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Table 2.

Zero-Order Correlations of Non-Instructional Variables
From Student Data and School Record Data with
(1) Comprehension Gain and (2) Vocabulary Gain
for Title I Students in Grades One Through Three

Learning Gain Scores	Student Data				School Record Data					
	Anxiety n=39	Popularity n=39	Happiness & Satisfaction n=39	"Parents Expect Too Much" n=39	Sex n=49	Free Lunch Eligibility n=34	Academic Aptitude n=49	Days Absent n=49	Number of Times Retained n=48	Number of Times Transferred School n=48
(1) Comprehension Gain	0.00 P=0.99	0.19 P=0.25	(-0.02) P=0.89	(-0.12) P=0.46	(-0.04) P=0.78	0.02 P=0.90	0.34 P=0.06	(-0.30) P=0.05	(-0.04) P=0.78	(-0.23) P=0.12
(2) Vocabulary Gain	0.07 P=0.69	0.04 P=0.79	(-0.18) P=.27	0.04 P=0.83	0.05 P=0.73	(-0.14) P=0.34	0.09 P=0.62	(-0.30) P=0.04	0.08 P=0.60	(-0.04) P=0.78

Vocabulary Gain

- Days Absent - greater learning gain was associated with more time in school

Correlations of 19 Independent Variables
with Learning Gain--Grades Four Through Seven

Tables 3 and 4 present the correlation of the 19 non-instructional variables with the three dependent variables: comprehension gain, vocabulary gain, and mathematics gain for Title I students in grades four through seven.

Independent variables that explained at least five percent of common variance were:

Comprehension Gain

- TV Watching - greater learning gain was associated with more TV watching
- Parents as Volunteer - greater learning gain was associated with parent volunteering to help the school
- Parent-Teacher Conferences - greater learning gain was associated with fewer conferences
- Number of Parents - greater learning gain was associated with two parents
- Number of Transfers - greater learning gain was associated with more transfers
- Parents "Expect Too Much" - greater learning gain was associated with feelings that students met parental expectations
- Happiness and Satisfaction - greater learning gain was associated with greater student satisfaction
- Reading Contract - greater learning gain was associated with the parent having signed a reading contract

Vocabulary Gain

- Strictness - greater learning gain was associated with less strictness
- Parent-Teacher Conference - greater learning gain was associated with fewer conferences
- Sex - greater learning gain was associated with being male
- Parent as Volunteer - greater learning gain was associated with parent volunteering to help the schools
- Happiness and Satisfaction - greater learning gain was associated with greater student satisfaction
- Number of Parents - greater learning gain was associated with having two parents
- Number of Transfers - greater learning gain was associated with more transfers

Mathematics Gain

- Number of Grades Repeated - greater learning gain was associated with repeating grades
- Parental Expectation of Schooling - greater learning associated with higher parental expectations
- Parent as Volunteer - greater learning gain was associated with parent volunteering to help the school

Table 3.

Zero-Order Correlations of Non-Instructional Variables
Collected from Parent Survey with
(1) Comprehension Gain, (2) Vocabulary Gain, and (3) Mathematics Gain
for Title I Students in Grades Four Through Seven

Learning Gain Scores	Non-Instructional Factors Collected From Parent Survey								
	Number of Siblings n=27	Number of Parents n=27	Parental Strictness n=26	Parental Expectation for Child's Schooling n=27	Reading Contract n=18	Parent Served As School Volunteer n=26	Number of Parent-Teacher Conferences n=25	Time Child Watches TV n=26	Child's Bedtime n=26
(1) Comprehension Gain	(-0.08) P=0.67	0.35 P=0.07	(-0.06) P=0.76	0.05 P=0.79	(-0.27) P=0.27	(-0.44) P=0.03	(-0.39) P=0.05	0.64 P=0.001	0.08 P=0.69
(2) Vocabulary Gain	0.12 P=0.56	0.31 P=0.11	(-0.51) P=0.01	(-0.04) P=0.85	(-0.05) P=0.83	(-0.33) P=0.10	(-0.38) P=0.06	0.11 P=0.58	0.21 P=0.31
	n=19	n=19	n=18	n=19	n=13	n=18	n=17	n=19	n=19
(3) Mathematics Gain	(-0.14) P=0.56	(-0.04) P=0.87	(-0.25) P=0.31	0.36 P=0.13	0.09 P=0.76	0.33 P=0.18	(-0.06) P=0.80	0.28 P=0.24	0.15 0.54

Table 4.

Zero-Order Correlations of Non-Instructional Variables
From Student Data and School Record Data with
(1) Comprehension Gain, (2) Vocabulary Gain, and (3) Mathematics Gain
for Title I Students in Grades Four Through Seven

Learning Gain Scores	Student Data				School Record Data					
	Anxiety n=44	Popularity n=44	Happiness & Satisfaction n=44	"Parents Expect Too Much" n=44	Sex n=29	Free Lunch Eligibility n=29	Academic Aptitude n=24	Days Absent n=29	Number of Times Retained n=29	Number of Times Transferred School n=29
(1) Comprehension Gain	0.03 P=0.86	(-0.00) P=0.99	0.30 P=0.04	(-0.31) P=0.04	(-0.10) P=0.59	0.00 P=1.00	0.07 P=0.73	0.15 P=0.43	0.15 P=0.43	0.31 P=0.10
(2) Vocabulary Gain	0.13 P=0.41	0.02 P=0.89	0.33 P=0.03	(-0.06) P=0.69	(-0.37) P=0.05	0.00 P=1.00	(-0.23) P=0.90	0.16 P=0.39	0.16 P=0.42	0.26 P=0.17
	n=28	n=28	n=28	n=28	n=20	n=20	n=17	n=20	n=20	n=20
(3) Mathematics Gain	(-0.12) P=0.53	(-0.02) P=0.93	(-0.10) P=0.61	(-0.29) P=.13	0.07 P=0.77	0.00 P=1.00	0.00 P=0.99	(-0.24) P=0.32	0.47 0.04	0.11 P=0.63

- Parents "Expect Too Much" - greater learning gain associated with feelings that students meet parental expectations
- TV Watching - greater learning gain was associated with more TV watching
- Strictness - greater learning gain was associated with less strictness
- Days Absent - greater learning gain was associated with more time in school

Identification of Fewer Variables That Account for a Substantial Correlation with Learning Gain

The second research question called for the identification of a few independent variables that were highly associated with learning gain. The purpose of the analysis was to reduce the number of independent variables from 19 to a lesser number such that the few variables selected explained a substantial proportion of the variance of the dependent variable. Identification of these few independent variables was accomplished through the MAXR multiple regression program of the Statistical Analysis Systems (SAS) package.[2] The MAXR procedure generates a series of models each of which maximizes the explained variance for a particular number of independent variables. For example, the first model consists of the best single predictor, the second model consists of the best two predictors, the third model consists of the best three predictors, etc. The highest order model was selected which explained a significant amount of variance.

Variables Associated with Comprehension - Grades 1-3

The best model was a two variable model that explained 22 percent of the variance. The two predictor variables were:

- Bedtime - greater learning gain was associated with earlier bedtime ($F = 4.07$, $p < 0.05$)
- Number of Transfers - greater learning gain was associated with fewer transfers ($F = 4.51$, $p < 0.05$)

Variables Associated with Vocabulary Gain - Grades 1-3

None of the one variable models was significant. Consequently, no predictors were identified.

Variables Associated with Comprehension - Grades 4-7

The best model was a three variable model that explained 63 percent of the variance. The three predictor variables were:

- Parent as Volunteer - greater learning gain was associated with parent volunteering to help the school ($F = 4.32$, $p \leq 0.05$)
- TV Watching - greater learning gain was associated with more TV watching ($F = 14.65$, $p \leq 0.05$)
- Parent-Teacher Conference - greater learning gain was associated with fewer conferences ($F = 4.58$, $p \leq 0.05$)

Variables Associated with Vocabulary - Grades 4-7

The best model was a one variable model that explained 22 percent of the variance. The single predictor variable was:

- Parental Strictness - greater learning gain was associated with less strictness ($F = 6.25$, $p \leq 0.05$)

REFERENCES

[1] Piers, Ellen V. The Piers-Harris Children's Self Concept Scale: The Way I Feel About Myself, Nashville, Tennessee: Counselor Recordings and Tests.

[2] SAS User's Guide, 1979 Edition. SAS Institute, Inc., Raleigh, North Carolina.

APPENDIX

Bowling Green
Student Survey

Circle either yes or no to each of the statements. There are no right or wrong answers. Circle yes if the statement is generally like you. Circle the no if statement is generally not like you.

1. I am a happy person . . . . . yes no
2. It is hard for me to make friends. . . . . yes no
3. I get nervous when the teacher calls on me . . . . . yes no
4. I am nervous . . . . . yes no
5. I worry a lot . . . . . yes no
6. I like being the way I am . . . . . yes no
7. I feel left out of things . . . . . yes no
8. I wish I were different . . . . . yes no
9. I am among the last to be chosen for games . . . . . yes no
10. I am unhappy . . . . . yes no
11. I have many friends . . . . . yes no
12. I am cheerful . . . . . yes no
13. People pick on me . . . . . yes no
14. I am often afraid . . . . . yes no
15. I cry easily . . . . . yes no
16. My parents expect too much of me . . . . . yes no

Bowling Green
Public School Survey

Parent Information Sheet

Dear Parents or Guardian:

Would you please take 10 minutes to answer all of the questions on this survey concerning _____. The Bowling Green Schools want to use this information to make improvements in the Title I program next year.

Thank you. Please give this sheet to your child to return to school.

---

1. Give the number of persons living in the child's home: (see example)

____ Mother
____ Father
____ Sister
____ Brother
____ Grandmother
____ Grandfather
____ Aunt
____ Uncle
____ Other

Example

1 Mother
0 Father
0 Sister
1 Brother
1 Grandmother
0 Grandfather
0 Aunt
1 Uncle
0 Other

This family has 4 persons other than the child living in the home.

2. Compared to parents of other children in your neighborhood, I am:

____ more strict than average
____ about average in strictness
____ less strict than average

3. I expect my child to finish the:

____ 8th grade
____ 9th grade
____ 10th grade
____ 11th grade
____ 12th grade
____ attend college

4. I have signed a parent contract promising to read to my child in the evenings.

☐ yes

Since I signed the parent contract I read about _____ minutes each evening to my child.

Before I signed the parent contract I read about _____ minutes each evening to my child.

☐ no

I read to my child evenings.

☐ yes ☐ no

I read about _____ minutes each evening to my child.

5. I have signed up to serve as a parent volunteer in the classroom days or as a helper in material development evenings.

☐ yes ☐ no

6. Circle the number of times you have visited your child's classroom this year.

0 1 2 3 4 5 6 7 8 9 10 11 12

7. Circle the number of parent-teacher conferences you have had this year.

0 1 2 3 4 5 6 7 8 9 10 11 12

8. My child is being sent to a special reading teacher.

☐ yes ☐ no

8.b. I am happy that my child is being sent to a special reading teacher.

☐ yes ☐ no

9. My child is being sent to a special math teacher.

☐ yes ☐ no

9.b. I am happy that my child is being sent to a special math teacher.

☐ yes ☐ no

10. My child watches TV about (check one):

____ 0 to 5 hours per week
____ 6 to 10 hours per week
____ 11 to 20 hours per week
____ 21 to 30 hours per week
____ 31 to 40 hours per week
____ More than 40 hours per week

11. My child usually goes to bed about (check one):

____ 7 p. m.
____ 8 p. m.
____ 9 p. m.
____ 10 p. m.
____ 11 p. m.
____ 12 p. m. or later

12. My child eats breakfast (check one):

____ at home
____ at school
____ does not eat breakfast
____ other (please explain) _____
_____